

Abstract

A downhole injector (10), (26), (38) and (54) is provided at the lower end of the production tubing string (TS) for passing liquids from a downhole hydrocarbon formation (F) into the tubing string while preventing gases from passing through the injector. The present invention uses the injector with an optimum wellbore annulus (A) back pressure using a regulator (64) and a pressure gauge (62) to enhance total gaseous and liquid hydrocarbon recovery. In wells requiring artificial lift, a downhole pump (P) may be used to efficiently pump formation fluids to the surface or alternatively one or more gas lift valves (LV) for raising slugs of liquid to the surface. The present invention may also be used with multi horizontal borehole technology for increasing hydrocarbon recovery by retaining gases in the formation to act upon liquid hydrocarbons by maintaining an overhead pressure for driving the liquids from the formation through the injector for maximum ultimate recovery and hydrocarbon reserve value.